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Remarks: 3. The attached is responsive to your commitment to Mr. Michaels, of the Mahon Committee.

[redacted]

Deputy Director  
Economic Research

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DD/OER 4F-18 [redacted]			4 Apr 69

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4 April 1969

### Chromite: World Demand and Supply

1. In response to increased demand, world production of chromite\* increased from 5.3 million tons\*\* in 1967 to 5.6 million tons in 1968, and probably will amount to 6.1 million tons in 1970. Metallurgical\*\*\* grade chromite is in particularly strong demand, partly because of the uncertainty that sufficient supplies will be made available (in view of the imposition of a boycott on Southern Rhodesia by the Free World's principal users of metallurgical grade chromite), and because world production of stainless and heat resistant steels continues to increase. There is, however, no stringency in the supply of the lower grades of chromite used for manufacturing chemicals and refractories. It is expected that Free World requirements for metallurgical grade chromite in 1969 will exceed one million tons.

2. Present world production of metallurgical grade chromite (see Table 1) seems adequate for world needs. It is mined in significant quantities in the USSR, Rhodesia, Turkey, Iran, and Albania. Chromite mined in South Africa, India and the Philippines, although principally of

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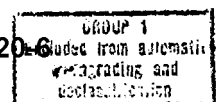
\*Chromite is chromium ore containing  $\text{Cr}_2\text{O}_3$  and admixtures such as iron oxide and alumina.

\*\*All tonnage figures are given in short tons.

\*\*\*Metallurgical grade chromite contains 46 or more percent of chromic oxide ( $\text{Cr}_2\text{O}_3$ ). Chemical grade chromite contains more than 40 percent but less than 46 percent chromic oxide and refractory grade contains not more than 40 percent chromic oxide. Nearly 65 percent of the chromite consumed in the US in 1967 was of metallurgical grade.

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chemical and refractory grades, also contains some ore of metallurgical grade.

3. The USSR is the world's largest producer of chromite with an output of about 2 million short tons in 1968. Production has been increasing steadily in recent years and continued increases are planned through 1970. No crash program for a high rate of increase in output is evident. In 1967, the USSR exported about 68 percent of its chromite output. The Free World received 83 percent of Soviet exports, with the US receiving the largest share. Other recipients, in order of importance, were Japan, West Germany, Sweden and France.

4. The Free World has been dependent on the USSR for metallurgical grade chromite for some years. The US, which reestablished the importation of substantial amounts of Soviet chromite in 1963 because it was lower priced than Turkish or Rhodesian chromite, obtained 32 percent of its imports of chromite of all grades from the USSR in 1968 compared with only 16 percent in each of the previous three years. Moreover, imports of Soviet chromite, all of which were of metallurgical grade, represent nearly 70 percent of US imports of that grade in 1968.

5. No details on the production of chromite in Rhodesia have been available since 1966 when production amounted to about 645,000 tons of all grades. It is known that chromite mining was continued in Rhodesia following international boycotts and the imposition of sanctions by the UN, and there are indications that the level of output has declined very little. The tonnage index of all Rhodesian mining production increased

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somewhat in 1967 over 1966 and employment in the mining industries also increased in 1967. Because chromite production comprises about 10 percent of Rhodesian mining output, it is unlikely that any increase in aggregate mining could have occurred if chromite mining were substantially curtailed. It is known that at least one chromite mine, with an annual production of about 50,000 tons was allowed to be taken out of production by the US owners and placed on a care and maintenance basis. It seems logical to conclude that chromite production probably did not fall below 500,000 tons nor was likely to be greater than 600,000 tons in 1968.

6. Although the US imported negligible amounts of metallurgical chromite of Rhodesian origin in 1968, it seems likely that Rhodesian chromite found a market in other parts of the Free World. It is believed that Rhodesian chromite is in current production in large volume and that it reaches the market through South Africa. Such an hypothesis is consistent with the recent very large increases in exports of South African chromite to Japan. These exports increased from 67,000 tons in 1966 to 180,000 tons in 1967, and 1968.

7. Turkey's chromite production is not doing well. Production fell from 583,000 tons in 1966 to 333,000 tons in 1967. It rose again to about 360,000 tons in 1968, but is not expected to exceed 400,000 tons by 1970. Production has suffered from depletion of high grade reserves. Currently, about half of Turkey's exports of chromite are concentrates of low grade materials that were ignored in the past.

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8. Albania produced about 350,000 tons of chromite in 1968, mostly of metallurgical grade. About 5,000 tons of Albanian chromite was imported by the US in 1968 but most of it is shipped to Communist China and to East Europe. Albania plans to increase chromite production gradually.

9. The output of chromite in Iran has been increasing steadily for several years reaching about 200,000 tons in 1968. Production will probably continue to increase into the 1970's. Communist China is the principal recipient of Iranian exports of chromite, followed by France, Czechoslovakia, and the Netherlands.

10. Most of the 500,000 tons of chromite produced in the Philippines in 1968 was of refractory grade. Metallurgical grade ore comprises only about 20 percent of the total and is exported primarily to Japan. However, as shown in Table 2, the US imports small amounts of metallurgical chromite from the Philippines.

11. India's production of chromite in 1968 amounted to only about 120,000 tons, mostly of chemical and refractory grade.

12. It seems likely that the world requirements for metallurgical chromite can be met from the world's supplies for the foreseeable future, but, even if the boycott is removed from Rhodesian chromite, the Free World is likely to continue to be dependent to some extent on the Communist World for metallurgical grade chromite.

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World Output of Chromite, 1967 and Estimates for 1968

(in thousands of short tons)

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	1967	1968
USSR	1,731	2,000
South Africa	1,267	1,300
Rhodesia*	550	550
Philippines	463	500
Turkey	333	360
Albania	349	353
Iran	198	200
India	115	120
Other**	<u>258</u>	<u>285</u>
Total	5,264	5,668

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\* The 1967 and 1968 figures for Rhodesia are estimates based on production in previous years.

\*\* Others are Japan, Pakistan, Cyprus, Greece, Sudan, Brazil, New Caledonia, Yugoslavia, and Cuba.

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US Imports of Chromite, 1968

Short Tons								
Country	Refractory Grade		Chemical Grade		Metallurgical Grade		Total	
	Not more than 40% chromic oxide (Cr <sub>2</sub> O <sub>3</sub> )		more than 40% but less than 46% chromic oxide (Cr <sub>2</sub> O <sub>3</sub> )		46% or more chromic oxide (Cr <sub>2</sub> O <sub>3</sub> )			
	Gross weight	Cr <sub>2</sub> O <sub>3</sub>	Gross weight	Cr <sub>2</sub> O <sub>3</sub>	Gross weight	Cr <sub>2</sub> O <sub>3</sub>	Gross weight	Cr <sub>2</sub> O <sub>3</sub>
Turkey	31,944	12,978	50,296	21,689	52,899	25,811	135,139	60,478
Philippines	134,100	44,192	--	--	15,000	8,810	149,100	53,002
South Africa	22,486	8,161	289,815	133,051	66,365	30,636	378,666	171,848
Rhodesia	--	--	843	379	--	--	843	379
USSR	--	--	--	--	299,527	163,798	299,527	163,798
Albania	--	--	--	--	5,164	2,324	5,164	2,324
Total	188,530	65,331	340,954	155,119	438,955	231,379	968,439	451,829